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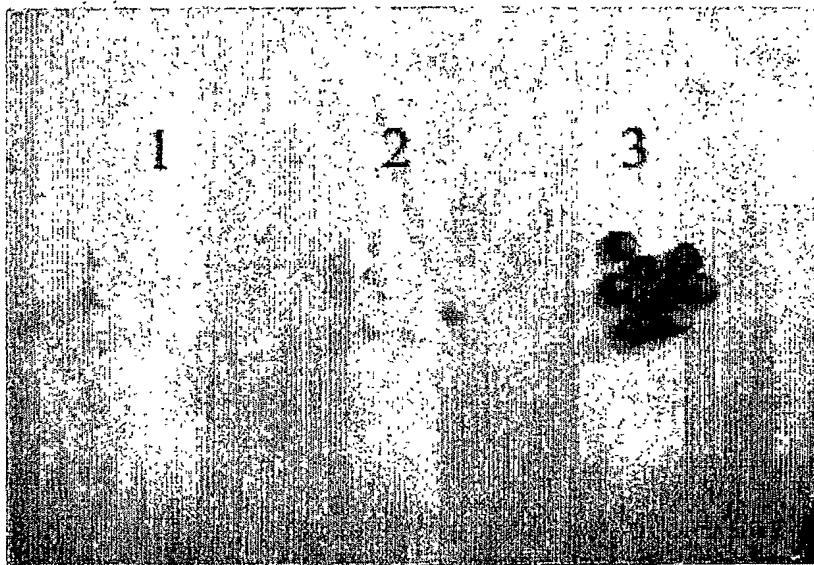
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(54) Title: POLYMER-SUPPORTED METAL NANOPARTICLES AND METHOD FOR THEIR MANUFACTURE AND USE



(57) Abstract: A method for making polymer-supported metal nanoparticles (3) is disclosed comprising providing a polymer support material (1), contacting the support with a metal nanoparticle or metal nanoparticle precursor (2), and contacting the support material and metal or metal precursor with a fluid that swells the support material sufficiently to allow the metal or precursor to diffuse into the support material. The method also may comprise reducing the metal of the metal precursor to provide a metal nanoparticle. Typically, the support material is a plastic. The metal can be various metals including palladium, rhodium, platinum, iridium, osmium, gold, nickel, iron or combinations thereof. The nanoparticles can comprise alloys or aggregates of two or more metals. The fluid can be

any fluid that facilitates polymer swelling, one example being supercritical carbon dioxide. A method for performing chemical reactions comprises providing a polymer-supported metal nanoparticle and selected reagents under conditions allowing chemical reactions to occur. The method may involve reducing or oxidizing sites of unsaturation or functional groups. Relative amounts of the reduction products can be varied by selecting an appropriate metal nanoparticle, polymer support material, or both.

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